TFTP Server Log Page
Page Application
Jan 6, 1998

This page is designed to show the recent TFTP activity as collected by the TFTP Server local application when the appropriate "TFTPLOG " data stream is present. See the *TFTP Server Log* document for more on this.

Page Layout
```
8 TFTP XACTN LOG  01/06/98 1356
NODE<0562> #RCVD=  25 LIST<0576>
NODE=0000 - BLKS=   0 TIME=0000
NODE06C0 R 190 1.1 1421:18 01/05
NODE06C1 R 190 1.1 1421:25 01/05
NODE06C2 R 190 1.1 1421:31 01/05
NODE06CA R 190 1.1 1421:38 01/05
NODE06CE R 190 1.1 1422:21 01/05
NODE06CF R 190 1.1 1422:33 01/05
NODE06CB R 190 1.1 1431:50 01/05
NODE0571 R 190 0.8 1546:51 01/05
NODE0571 R 190 0.9 0824:48-09+16
NODE06C1 R 190 1.1 0833:00-10+60
NODE06C2 R 190 1.1 0833:03-14+20
```

This page design is adapted from that used for displaying recent Swift Digitizer snapshot activity. This example shows both the specified parameters and the resulting listing. Interrupt on the second line to cause data collection. Interrupt on the third line to change the filter parameters that may be used to restrict the listing.

On the second line one may enter the node# whose TFTP diagnostics are to be listed, plus the target node# used for the serial port output. A keyboard interrupt on that line causes the program to request the contents of the data stream from the indicated node, displaying them on the lines following the third line, which holds the filtering parameters.

The filtering parameters allow selection of records based upon a specified node#, a direction of transfer, the number of blocks transferred, and the time. The direction of transfer may be 'R' (TFTP Read requests) or 'W' (TFTP Write requests) or '–' (either). The number of blocks is the number of 512-byte blocks transferred for the entire TFTP transaction. The time may be specified as hours and minutes of the present day. For each of the three numeric filter parameters, an associated operator character may be specified. Operators may be '=' (equal), '!' (unequal), '<' (less than), or '>' (greater than or equal). The records listed will respect a numeric filter parameter only if the parameter value is nonzero; when it is zero, that parameter does not restrict the listing. An interrupt on the third line causes the program to read new filter parameters from the screen. If data has already been collected from the node under study, the data will be re-listed using the new parameters. If no data has yet been collected, the new filter parameters will be applied to the next data acquisition to be performed (via interrupt on the second line).

The screen display may be scrolled by using the raise/lower buttons. Use raise to advance forward through the listing. Use lower to move in reverse. When the display is first presented in response to an interrupt on the second line (provoking data acquisition), the scrolling parameter is adjusted so that the tail end of the listing is shown, thus displaying the most recent records. When an interrupt occurs on the third line, the scrolling is adjusted to the beginning of the listing, commencing with the oldest records collected.

In brief, when first entering the page, enter the target node# and interrupt (on the second line). Assuming that no filtering is specified, one should immediately see a listing of the most recent 11 TFTP transactions performed by that node's TFTP server. Scroll backwards to see earlier transactions. Select filtering parameters if desired. The last-used filter parameters are retained across page call-ups.

The format of the serial port listing is very similar to that on the screen.

```
8 TFTP XACTN LOG  01/06/98 1355
NODE<0562> #RCVD=  25 LIST<0576>
NODE=0000 - BLKS=   0 TIME=0000
IP-Addrs  Blks ETm HrMn:Sc-Cy+ms
NODE06B1 R 190 1.1 1415:50 01/05
NODE06B2 R 190 3.1 1415:59 01/05
NODE06B3 R 190 1.1 1416:18 01/05
NODE06B4 R 190 1.1 1416:32 01/05
NODE06B5 R 190 1.1 1416:43 01/05
NODE06B6 R 190 1.1 1417:55 01/05
NODE06B7 R 190 1.1 1418:08 01/05
NODE06B9 R 190 1.1 1418:22 01/05
NODE06BA R 190 1.1 1419:06 01/05
NODE06BB R 190 1.1 1419:18 01/05
NODE06BC R 190 1.1 1419:28 01/05
NODE06BD R 190 1.1 1419:35 01/05
NODE06BE R 190 1.1 1419:42 01/05
NODE06BF R 190 1.1 1419:49 01/05
NODE06C0 R 190 1.1 1421:18 01/05
NODE06C1 R 190 1.1 1421:25 01/05
NODE06C2 R 190 1.1 1421:31 01/05
NODE06CA R 190 1.1 1421:38 01/05
NODE06CE R 190 1.1 1422:21 01/05
NODE06CF R 190 1.1 1422:33 01/05
NODE06CB R 190 1.1 1431:50 01/05
NODE0571 R 190 0.8 1546:51 01/05
NODE0571 R 190 0.9 0824:48-09+16
NODE06C1 R 190 1.1 0833:00-10+60
NODE06C2 R 190 1.1 0833:03-14+20
```

The length of the listing is not limited by the size of the screen, and an extra title line is inserted. The meaning of the fields listed are the node#, the direction indicator, the number of blocks transferred, the elapsed time in seconds of the TFTP transaction, and the time of completion of the TFTP transaction. The time is displayed with two variations. For each variation the time hours, minutes and seconds are shown. For times for the present day, the 15 Hz cycle (range 00–14) is appended, followed by the time since the start of that cycle in milliseconds. For times previous to today, the month and day is indicated instead.

IP Address Translation

The node#s indicated on the listings are derived from the IP addresses found in the data stream records by performing a search in the local (to the node executing the page application) IPNAT system table. The IPNAT is maintained by the DNSQ local application which serves as a Domain Name Service client to keep the contents of the table current. The records in this table include both the node# and the corresponding IP address. If the search fails to find a match, the IP address is shown in one of two formats. If the most significant two bytes of the IP address match the most significant two bytes of the local node's own IP address, a dotted decimal notation is used to show the remaining two bytes, such as ".134.162", else the full IP address is shown in hex. (All this has to do with fitting the format into the small 8-character field available, of course.)

An IP address unknown to the local IPNAT can be automatically entered by causing the local node to make a data request to the that node#. This will result in the DNSQ client sending a request to the Domain Name Service to get the IP address of that node#. Upon successfully receiving a valid response from the DNS, a new entry will be added to the IPNAT, which should remain forever, even across system resets. Every 8 hours, each entry in the table is refreshed by DNSQ (not all at the same time) as it re-issues a DNS request. This insures that the information therein does not become too stale. Note that entries that are not within the local network can also be registered in this table, analogous to the "hosts" file used by Unix systems. The node name NODExxxx is a convention used by all IRMs. It is what allows the DNSQ scheme (of finding the IP address given a node#) to work.